Dhaka Board 2016

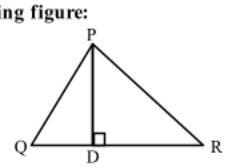
Time — 35 minutes Marks — 35 **Higher Mathematics: MCQs** Subject Code | 1 | 2 | 6 |

*[Answer **all** the questions. Each question corries **one** mark. Block fully, with a ball-point pen, the circle of the letter that stands for the correct/best answer in the "Answer Sheet" for Multiple Choice Questions Examination. **Candidates are asked not to leave any mark or spot on the question paper.**]*

1. Which one of the following is symmetric?
a $a^2 + b + c$ b $2a^2 - 5bc - c^2$
c $x^2 - y^2 + z^2$ d $xy + yz + zx$

2. What is the co-efficient of x^2 in expanding of $(1 + 3x)^5$?
a 80 b 90 c 170 d 270

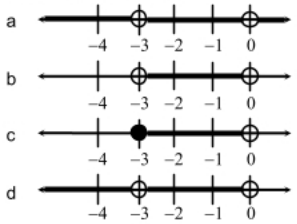
Answer the questions from 3 and 4 no. in the following figure:



3. sinB + cosC = ?
a $\frac{2b}{a}$ b $\frac{2a}{b}$ c $\frac{a^2+b^2}{ab}$ d $\frac{ab}{a^2+b^2}$

4. Which is the value of tanB?
a $\frac{a}{a^2-b^2}$ b $\frac{b}{a^2-b^2}$
c $\frac{a}{\sqrt{a^2-b^2}}$ d $\frac{b}{\sqrt{a^2-b^2}}$

5. Given that, $-3 \le x < 0$, which one of the correct number line?

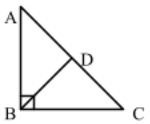


Answer the questions from 6 and 7 No based on following information:
A box cortains 12 red balls, 16 white balls and 24 black balls. A ball is taken rendomly.

6. What is the probability that the ball is white?
a $\frac{1}{52}$ b $\frac{4}{13}$ c $\frac{1}{13}$ d $\frac{13}{52}$

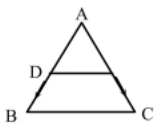
7. What is the probability that the ball is red or white?
a $\frac{12}{13}$ b $\frac{10}{13}$ c $\frac{9}{13}$ d $\frac{7}{13}$

8. In the following figure D is middle point of AC, then—



i. $AB^2 + BC^2 = 2(AD^2 + BD^2)$
ii. $AB^2 = AC^2 - BC^2$
iii. Perpendicular projection of AB is AD
Which one of the following is correct?
a i and ii b i and iii
c ii and iii d i, ii and iii

9.



If D and E are the middle point of AB and AC, then, which is correct?
a $\vec{BC} = 2(\vec{AE} - \vec{AD})$ b $\vec{BC} = 2(\vec{AD} - \vec{AE})$
c $\vec{BC} = 2(\vec{AE} + \vec{AD})$ d $\vec{BC} = 2(\vec{AB} + \vec{AC})$

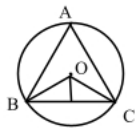
10. If AB internally divided in point C in the ratio of m : n, then [$\underline{a}$, $\underline{b}$ and $\underline{c}$ are respectively the position vectors of the points A, B and C.].
a $\underline{c} = \frac{\underline{na} + \underline{mb}}{m+n}$ b $\underline{c} = \frac{\underline{na} - \underline{mb}}{m+n}$
c $\underline{c} = \frac{\underline{na} + \underline{mb}}{m-n}$ d $\underline{c} = \frac{\underline{ma} + \underline{nb}}{m+n}$

11. If $A \subset B$ which is the correct of the following?
a $A \cap B = B$ b $A \cup B = B$
c $A \cup B = A$ d $A \cup B = A \cap B$

12. The length of sides of a triangle are 3, 4, and 5 cm. What is the square sum of the medians?
a 6.12 sq. cm. b 12.5 sq.cm.
c 37.5 sq. cm. d 150 sq.cm.

13. If $\angle B = 90°$ of ΔABC, which is the correct?
a $AB^2 = BC^2 + AC^2$ b $AC^2 = BC^2 + AB^2$
c $AB^2 + BC^2 + AC^2 = 0$ d $BC^2 = AB^2 + AC^2$

14.



In figure BC = 4cm and length of the perpendicular OP is 1cm.
i. Radius of the circle is $\sqrt{5}$ cm.
ii. Area of ΔOCP is 1 square cm.
iii. Consider OP as a radius, circumference of the circle is 2π cm.
Which one of the following is correct?
a i and ii b i and iii
c ii and iii d i, ii and iii

15. If A = {a, b, c, d, e} find the elements of P(A) = ?
a 5 b 10 c 25 d 32

16. Find the value of cosec $\left(-\frac{\pi}{3}\right)$.
a $-\frac{2}{\sqrt{3}}$ b $-\frac{1}{2}$ c $\frac{1}{2}$ d $\frac{2}{\sqrt{3}}$

17. If $p^x = y$, which one of the following is correct?
a $p = \log_x y$ b $x = \log_p y$
c $x = \log_y p$ d $y = \log_p x$

18. Find the value of $\cos^2\frac{\pi}{3} - \sin^2\frac{\pi}{4}$.
a $-\frac{1}{4}$ b $-\frac{1}{2}$ c $\frac{1}{2}$ d 1

19. What is the value of sin 120°?
a $\frac{\sqrt{3}}{2}$ b $\frac{1}{2}$ c $\frac{1}{\sqrt{2}}$ d $-\frac{1}{2}$

20. 1 Radian = ?
a 60° b 59°17′44.81″
c 58°17′44.81″ d 57°17′44.81″

21. Radius of a circle is 5 cm. What is measure of central angle based on 13 cm are?
a 0.38° b 0.38^c c 2.60^c d 2.60°

22. What is the Remainder when $p(x) = 36x^2 - 8x + 5$ is divided by $(x - 1)$?
a 49 b 41 c 33 d 23

Answer question 23 and 24 No. based of the following information $x^y = y^x$, then—

23. What is the value of $\left(\frac{x}{y}\right)^{\frac{x}{y}}$?
a $x^{\frac{x}{y}-1}$ b $x^{\frac{y}{x}-1}$ c $x^{1-\frac{x}{y}}$ d $x^{1-\frac{y}{x}}$

24. If x = 2y, then y = ?
a 2 b 3 c 4 d 5

25. The roots of the equation $2x^2 - 7x - 1 = 0$ is—
i. real ii. unequal
iii. irrational
Which one of the following is correct?
a i and ii b i and iii
c ii and iii d i, ii and iii

26. If $F(x) = \sqrt{x - 1}$, which one is the domain of F(x)?
a $\{x \in \nabla : x \le 1\}$ b $\{x \in \nabla : x \ge -1\}$
c $\{x \in \nabla : x \le -1\}$ d $\{x \in \nabla : x \ge 1\}$

27. The squaring difference of two positive integer is 13 and product is 42. What are the two numbers?
a 1, 42 b 2, 21 c 3, 14 d 7, 6

28. Which is the simplify value of $\sqrt[15]{x^{10}\sqrt{x^8}\sqrt{x^4}}$?
a x^{15} b x c $x^{\frac{1}{15}}$ d 1

29. The value of $x^3 + y^3 + z^3 - 3xyz$
i. $(x + y + z)(x^2 + y^2 + z^2 - xy - yz - zx)$
ii. $(x + y + z)(x^2 + y^2 + z^2 + xy + yz + zx)$
iii. $\frac{1}{2}(x + y + z)\{(x - y)^2 + (y - z)^2 + (z - x)^2\}$
Which one of the following is correct?
a i and ii b i and iii
c ii and iii d i, ii and iii

30. If $3^{mx-1} = 3a^{mx-2}$, [$a > 0$, $a \ne 3$, $m \ne$] then, what is the value of x?
a $\frac{m}{2}$ b $\frac{2}{m}$ c 2m d 2^m

Answer 31 and 32 No. in the following cases A(0, –3) B(4, –2) and C(16, a) are three points:

31. What is the slope of AB?
a $\frac{5}{4}$ b $-\frac{5}{4}$ c $\frac{1}{4}$ d $-\frac{1}{4}$

32. If the given points are coliner, what is the value of a?
a 0 b 1 c 2 d 3

33. i. $\binom{5}{0} = 1$ ii. $\binom{5}{1} = 5$
iii. $\binom{5}{2} = 10$
Which one of the following is correct?
a i and ii b i and iii
c ii and iii d i, ii and iii

34. Given that 1 + 0.1 + 0.01 + ... ∞, which is the summation of infinite series?
a $\frac{10}{9}$ b $\frac{9}{10}$ c $\frac{-10}{9}$ d $\frac{-9}{10}$

35. Given that, 2 + 4 + 6 + 8 + ...
i. n-th term is 2n
ii. The sum of n terms is n(n + 1)
iii. There is no summation
Which one of the following is correct?
a i and ii b i and iii
c ii and iii d i, ii and iii

Ans.																																												
	1	d	2	b	3	a	4	d	5	c	6	b	7	d	8	a	9	a	10	a	11	b	12	c	13	b	14	d	15	d	16	a	17	b	18	a	19	a	20	d						
	21	c	22	c	23	a	24	a	25	d	26	d	27	d	28	b	29	b	30	b	31	c	32	b	33	d	34	a	35	d																